

## **Effects Of 9 Months Of Whole Body Vibration In Obese Middle-Aged Women**

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Obesity is associated with many chronic health conditions. A reduction of body weight in obese persons has been shown to improve health status. However, a reduction in body weight may reduce the mineralization of load-bearing bones.

**PURPOSE:** We investigated the effects of caloric restriction (CR) combined with passive exercise (whole body vibration: WBV) and/or active exercise (aerobic) vs CR alone on body composition (BC) and bone mineral density (BMD).

**METHODS:** Sixty obese middle-aged women volunteers were divided into four intervention groups. Forty-five women [mean 41.2±0.9 (SE) yr, 33.8 ±0.5 %fat] completed the study. Groups were: CR only (n=9), CR + WBV (n=13), CR + aerobic exercise (n=11), and CR + WBV + aerobic (combined; n=12). Training was 33min/d, 5d/wk, for 9 mo. For a WBV session, subjects completed three 11-min sets of a rotation on the WBV platform that included 4 different body positions: standing (5 min), 2 types of a squat (2 min each) and one with greater upper body vibration (palms on the platform) (2 min). WBV intensity was manipulated by adjusting the frequency at an amplitude of 13.6 cm. Frequency was calculated by multiplying body wt by a constant that was previously determined to elicit a given  $\text{VO}_2$ . Aerobic (treadmill and cycle ergometry on alternate days) intensity was 55%  $\text{VO}_2\text{max}$  which metabolically matched WBV intensity. Intensity was adjusted every 3 mo. Diet was 70% of pretraining energy intake (3-day diet record). BC (fat wt, lean wt, and %fat from DEXA, plus 3 skinfolds and 4 circumferences) and BMD (DEXA) were measured before and at 3, 6, 9 mo of training.

**RESULTS:** A 4 (group) × 4 (time points, repeated) ANOVA and post hoc LSD showed that body wt and BC variables significantly improved from pre- to post-training in all groups ( $P < 0.05$ ), with greater ( $P < 0.05$ ) improvements in the 3 exercise groups vs the diet group. Whole body, lumbar spine, hip, and forearm BMD did not change ( $P > 0.05$ ).

**CONCLUSIONS:** WBV with CR was as effective as aerobic exercise plus CR in improving body composition, and both were more effective than CR alone. The significantly greater loss of body mass was observed in the CR+WBV group vs the

CR only group had no negative effect on BMD. The efficacy of WBV as an intervention to maintain/improve bone health should be studied further.

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